AMENDMENTS TO THE CLAIMS

Claims 1-20 (canceled)

21. (New) A pixel signal processing apparatus that, given a group of pixel signals from pixels arrayed on a two-dimensional plane, each pixel having one of a first to an N-th spectral characteristic, generates a pixel signal having an L-th spectral characteristic at a first pixel position of interest where there is a pixel signal having a K-th spectral characteristic (K and L being different integers between 1 and N, inclusive), comprising:

a regression analysis means for performing a regression analysis in a plurality of pixel positions in an area neighboring the first pixel position of interest, using the pixel signals having the K-th spectral characteristic as an explanatory variable and the pixel signals having the L-th spectral characteristic as a purpose variable, to calculate a regression line

$$y = a \cdot x + b \qquad \ldots(1)$$

('y' being the pixel signal having the L-th spectral characteristic, 'x' being the pixel signals having the L-th spectral characteristic, 'a' and 'b' being constants representing the slope and intercept of the regression line)

expressing a correlation of the pixel signals having the K-th spectral characteristic with the pixel signals having the L-th spectral characteristic;

a calculating means for determining the pixel signal having the L-th spectral characteristic at the first pixel position of interest by applying a conversion formula based on the

regression line to the pixel signal having the K-th spectral characteristic at the first pixel position of interest; and

a selection means for sequentially selecting different pixels as the pixel of interest and, for each selected pixel of interest, using the regression analysis means and the calculating means to determine the pixel signal having the L-th spectral characteristic.

22. (New) The pixel signal processing apparatus of claim 21, further comprising an imaging device with N types of photoelectric conversion elements, each having one of the first to N-th spectral characteristics, arrayed on a two-dimensional plane, wherein:

the selection means determines the K-th and L-th spectral characteristics in order of the strength of the correlation between their spectral characteristics.

23. (New) The pixel signal processing apparatus of claim 22, wherein:

the imaging device has one of red (R), green (G), and blue (B) spectral characteristics;

the selection means first determines the green pixel signals at pixel positions where red pixel signals are present and the green pixel signals at pixel positions where blue pixel signals are present;

next, the selection means determines the red pixel signals at pixel positions where green pixel signals are present and the blue pixel signals at pixel positions where green pixel signals are present; and

finally, the selection means first determines the blue pixel signals at pixel positions where red pixel signals are present and the red pixel signals at pixel positions where blue pixel signals

are present.

24. (New) A pixel signal processing method that, given a group of pixel signals from pixels arrayed on a two-dimensional plane, each pixel having one of a first to an N-th spectral characteristic, generates a pixel signal having an L-th spectral characteristic at a first pixel position of interest where there is a pixel signal having a K-th spectral characteristic (K and L being different integers between 1 and N, inclusive), comprising:

a regression analysis step for performing a regression analysis in a plurality of pixel positions in an area neighboring the first pixel position of interest, using the pixel signals having the K-th spectral characteristic as an explanatory variable and the pixel signals having the L-th spectral characteristic as a purpose variable, to calculate a regression line

$$y = a \cdot x + b \qquad \ldots(1)$$

('y' being the pixel signal having the L-th spectral characteristic, 'x' being the pixel signals having the L-th spectral characteristic, 'a' and 'b' being constants representing the slope and intercept of the regression line)

expressing a correlation of the pixel signals having the K-th spectral characteristic with the pixel signals having the L-th spectral characteristic;

a calculating step for determining the pixel signal having the L-th spectral characteristic at the first pixel position of interest by applying a conversion formula based on the regression line to the pixel signal having the K-th spectral characteristic at the first pixel position of interest;

and

a selection step for sequentially selecting different pixels as the pixel of interest and, for each selected pixel of interest, using the regression analysis step and the calculating step to determine the pixel signal having the L-th spectral characteristic.

25. (New) The pixel signal processing method of claim 24, wherein said pixel signals are associated with an imaging device with N types of photoelectric conversion elements, each having one of the first to N-th spectral characteristics, arrayed on a two-dimensional plane, and wherein:

the selection step determines the K-th and L-th spectral characteristics in order of the strength of the correlation between their spectral characteristics.

26. (New) The pixel signal processing method of claim 25, wherein:

each photoelectric conversion element has one of red (R), green (G), and blue (B) spectral characteristics;

the selection step first determines the green pixel signals at pixel positions where red pixel signals are present and the green pixel signals at pixel positions where blue pixel signals are present;

next, the selection step determines the red pixel signals at pixel positions where green pixel signals are present and the blue pixel signals at pixel positions where green pixel signals are present; and

finally, the selection step first determines the blue pixel signals at pixel positions where

red pixel signals are present and the red pixel signals at pixel positions where blue pixel signals are present.